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GOLD IN CHUKOT NATIONAL OKRUG

/Note: Names followed by an asterisk (*) are approximations of the Russian where such names were unidentified./

The question of the Chukotsk gold deposits has been left unanswered to date (1937). Based on their geological formations, the Alaska and Chukotsk deposits are thought to belong to the same geological period. The Stanovoy mountain ranges, and other mountains extending from Mongolia to Alaska, are popularly thought to form one of the world's gold regions.

The following gold deposits are located along the coast of Chukotsk Peninsula and in inland regions.

The gold area between Cape Dezhneva and Cape Litke has already been confirmed, and the deposit on the Tunil'tan* River, 12 kilometers west of Cape Dezhneva is also known. Other known deposits are at Uelen Salt Lake, near Serdtse-Kamen', Kolyuchin Gulf, Amguyema and Vankarem rivers, and Chaun Inlet (Chaunskaya Guba). Geologist Tolmachev, who traveled along the Chukotsk coast in 1909, stated that useful minerals, such as gold, graphite, and iron discovered near Cape Dezhneva, should be found along the coast as far as the Kolyma River.

The well-known goldfields on the Bering Sea coast are near Cape Novo-Sel'tsev, Lavrentiya Bay and Lake Lavrentiya region, near Capes Yandagay and Chaplina (north of the latter), several places near Provideniya Bay, on Olennaya River between Emma and Plover Bays, and on several rivers near Kresta Gulf.

A list of deposits by Karayev, a long-time resident of Chukotsk, includes the following two besides a majority of the aforementioned deposits: the Russkoy River (Raymida*) and the Ichugma* River.

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The placer gold deposits in the Anadyr region are not limited to the well-known deposits on the Volch'ya River (Skorbutnaya, Vetleson, Nado and Kolbi rivers), but the deposits on the right bank of the Anadyr River (Bol'shaya or Velikaya and Yeropol' rivers, Lake Krasnoye, and Krasnin River), and deposits on the left bank (Tanyurer River and its right tributaries, Chayaprin* and Belaya rivers) have also been known for a number of years. According to written records and statements by eyewitnesses, gold was mined in the upper reaches of the Belaya River long ago by the Intelmens (Kamchadals) and Luoravetlans (Chukchi).

The Anadyr Survey Group of the AKO (Kamchatka Company), which conducted survey work from 1928 to 1930, gave a negative decision on the industrial value of the Volch'ya River basin. However, it is understood that the 3-year work of this survey group was very localized.

In 1930, the AKO and the Soyuzzoloto sent a prospecting group, under Ivachenko with other geologists, including Pavlov, Donskoy, Isakov, and Stanov, to Chukotsk Peninsula. The area to be surveyed was located east of the line drawn from Kolyuchin Gulf to Kresta Gulf. According to meager information, it appears that the entire eastern peninsula, including Kresta Gulf, Lavrentiya Bay, and Kolyuschin Gulf, was surveyed.

Such authorities as Anert, Bogdanovich, and Polevoy have always stressed the importance of the Chukotsk deposits, paying particular attention to survey and prospecting results. As the two previous surveys (Anadyr and Chukotsk) cannot be considered adequate, a large-scale survey must be made in the near future.

Gold field in Anadyr-Chukot Region

The geological surveys of K. I. Bogdanovich, I. A. Korzukhin, G. A. Borisov, and P. I. Polevoy clarified the relation between gold-bearing qualities and metamorphic schist and crystalline schist. However, it is difficult to distinguish some schist from schist of the Nome gold field, which is composed of calcareous mica schist.

While surveying the Chukotsk Peninsula, Bogdanovich discovered an area between Cape Litke and Cape Dezhneva where limestone with quartz vein and iron pyrites, and clayey phyllite were developed extensively. In the eroded coastal area, Bogdanovich also discovered a beach placer with gold content of 1.5 zolotnik per 100 pud. He stated that gold could be found in various rivers crossing the tundra in this region.

Later Korzukhin searched along the Tunil'tan* River, about 12.7 kilometers from Cape Dezhneva, for placer gold seams on top of clay slate which changed to mica sheet; but it was found that gold was connected only with schist, and no gold was found in trial shafts bored in areas where schist was not developed Korzukhin explained that the weak gold vein was due to lack of gangue or schist.

According to Bogdanovich, the rocks of Cape Kuntuglen* differ from the mica schist of Nome in their greater viscosity.

Near Lavrentiya Bay, Bogdanovich did not discover any schist and found only crystalline limestone. Korzukhin insisted on the presence of a small amount of schist, but no satisfactory trace of gold was found in any trial shaft. Bogdanovich discovered clay schist with traces of gold and ruby sand on Cape Martens and concluded that schist extended also to the northwest from Marich (Yanrakenotvaam.) River.

Bogdanovich recognized the relationship between the metamorphism of sedimentary rocks and the contact zone of granite and sedimentary rocks, and thought that such an extensively developed contact zone should be found in the ancient watershed area north of Mechigmen Bay and west of Cape Kuntuglen*. There was speculation on the possibility of the northern slope of the Anadyr Mountains west of upper Kolyuchin Bay being a similar watershed.. The mountain area of Chaunskaya Bay is a wide contact zone of clay slate and mica schist with granite.

Korzukhin believed that rocks of the Nome system must lie northwest of the coast of Bering Sea in the indented shore line northwest of Provideniya Bay.

Geologist Tolmachev felt that gold, graphite, and iron found at Cape Dezhneva might also be found along the entire coast of the Arctic Ocean as far as the Kolyma River.

The relationship between metamorphic schist and crystalline schist is further seen in the deposits in the basin of the Volch'ya River, which flows into Kanchalan Bay in Anadyr Gulf.

Polevoy claimed that schist in the Volch'ya River basin differs from the Nome system schist in its lower mineralization rate, and that, although this schist closely resembles the Mesozoic era schist of the Anadyr River in its outer appearance, it is basically different when viewed under a microscope.

Schist of the Nado River should belong to phyllite, rich in carbon. It dips abruptly to the northwest and is pierced by a block of lamprophyre. A bojite vein, which passes below the composite basins of the Nado and Vetleson Rivers, changes to amphibolite at the contact zone with schist, and schist changes to mica schist, indicating a high rate of mineralization. As the rivers flowing over the schist are rich in placer gold, it is apparent that gold is related to contact zones of schist.

A dark metamorphic schist zone appears in the upper reaches of the Okeanskaya River, which flows into Anadyr Gulf, and extends from southwest to northeast along the northwest slope of the mountain range, then over the Vetleson River and to the source of the Kolbi River, which empties into Anadyr Gulf.

The principal gold rivers in this area are the Skorbutnaya, Nado, Vetleson, and Kolbi; the length of the placer gold veins depends upon the width of the schist zone.

The metamorphic system of schist can be traced to Kresta Bay in the northeast, where the rivers already seemed to have indicated adequately their gold-bearing quality. The same metamorphic system is rumored to be continued further north to the source of the Vankarem River.

Besides the chief gold-bearing characteristics of the placer gold seams in the Chukotsk-Anadyr region, other indications of gold, such as the existence of a quartz vein in schist, has been recognized. However, quartz vein was not found to be the principal source of gold in this area.

S. D. Ovodenko observed, and Bogdanovich and Polevoy confirmed, the fact that gold can also be found in areas outside of metamorphic sedimentary rock zones.

Traces of gold have been found in crumbled granite near Cape Serdtse Kamen' and near Novo-Seltsev.

In the Olennaya River in Provideniya Bay where traces of gold have been discovered, detritus of granite-pegmatite, which cut across granite as an ore vein, are found abundantly.

When analysis was made of the quartz which intersects the granite on the cape between Emma and Plover Bays, traces of gold were also found.

In the Anadyr region, gold was not limited to the Volch'ya River basin and the Anadyr River Bay. As a result many survey parties went into the hinterland. Polevoy was familiar with prospecting work in the Belaya and Tanyurer Rivers, left tributaries of the Anadyr River, in several rivers of Lake Krasnoye on the right bank of the Anadyr River, and in Yeropol' River in the upper reaches of the Anadyr River and Bol'shaya River. According to a report of gold by prospector Kovarenko, placer gold has been discovered 75 kilometers from the mouth of the Teylpevlin* River, a right tributary of the Tanyurer River.

Mining engineer Ovdenko wrote: "The existence of gold in the tributaries of the Anadyr River, as in the Krasnaya and Belaya Rivers, was discovered long ago by Russian prospectors." Polevoy learned of a small gold placer of industrial value in the Belaya River directly from a prospector who worked in that area.

Polevoy was able to separate ruby sand, an ore found in conjunction with gold at Nome, when he washed the alluvium on the bank at the mouth of the Lamutskaya River on the shore of Lake Krasnoye.

According to Polevoy's report, the geological condition of the Volch'ya River, that is, the development of metamorphic rocks, is not repeated in other areas in the Anadyr region. The existence of gold in various tributaries of the Belaya River and Lake Krasnoye coincides with the development of quartz trachite. Moreover, the type of gold deposits which are related to new acidic volcanic rocks, as seen in Kol' and Kol'chan Rivers on the Okhotsk Sea north of Nikolayevsk, seem to be repeated in this area.

In summarizing the discussion, Bogdanovich indicated the following as signs of gold in the Chukotsk area: severe metamorphism of sedimentary rocks which accompany the appearance of quartz vein and granite, and development of pegmatite granite vein and quartz vein in granite and other volcanic rocks.

Polevoy considered tracing the metamorphic schist system as the first problem of prospectors in the Anadyr region, and emphasized the importance of the contact zones of the schist system and intrusive rocks and the contact zones of metamorphic schist and limestone. He based this theory on actual experience in the Seward Peninsula where the contact zone of ragstone and graphite schist proved to be the best qualification in searches for placer gold diggings. The contact zone of ragstone and quartz trachite should also be noted.

As shown in the foregoing paragraphs, various scientists were in general accord supporting each other's theories.

Data on quality of placer gold seams are very meager. At present, only the placer gold deposits on the Nado River have been studied. In that area, the width of the peat seam is 0.18 to 0.71 meters, the width of the gold-bearing seam is 0.18 to 1.08 meters, and the gold content is 7.81 to 20.83 grams per ton of sand. Gold is, of course, grain, and native gold weighing more than 21 grams is not rare. The purity of gold is 861 to 870. The width of the rich gold area is thought to be 32 to 43 meters; only Yukherov claims it to be 11 meters. This survey data concerns only a limited area in the Nado River, which totals 320 meters in length and lies downstream from the composite basin. Basalt and its agglomerate, which appear further down the river, are very low in gold content, as gold is carried down from upstream. In the composite basin in the upper reaches, the alluvial formation is deep and potholes dug by glaciers are thought to be packed with decayed substances. As there is little alluvium and a small amount of gold in the Nado River, illegal miners were usually attracted to gorges of other rivers, even though additional complicated operations were necessary in those areas.

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Prospectors in the Chukotsk Peninsula must consider the peculiar prospecting problem of permafrost. In Alaska, this problem is solved by the use of steam points, which thaw out the frozen ground by passing steam through drills. In the last 10 years, Russian gold miners have also been using steam equipment.

In the Anadyr-Chukotsk region, not only river-bed gold placers, but terraced placers and inclined placers can be found, as in Nome. Polevoy advanced the theory that placer gold deposits of the Nado River are increasing due to erosion of the hills.

Small-grained gold was seen on the sandbar in Anadyr River Bay, and there are hopes of discovering modern placers and ancient buried beach placers in other places.

If, in addition to the already known caldera of the Pliocene epoch, traces of sea of the Pliocene epoch can be discovered deep in the alluvial formation of coastal tundra, the conditions for development and changes of shore lines at Anadyr River Bay and Nome could be the same. Then, discovery of not only modern beach placers, which contain little gold, but of ancient buried beach placers, which were formed in the era when sea erosion was delayed for a while, can be expected.

The tundra and overflow rock of basalt, which cover the lower Tertiary period in the Volch'ya River area, do not give much hope for discovery of beach placers in that region. However, in Anadyr River Bay, especially towards the Anadyr Gulf area, discovery of buried beach placers may be expected. The continuation of the buried beach placers to Nome has been well studied by an American geologist, P. S. Smith. A great portion of the gold in Nome was extracted from this unique placer.

Development of the mining industry in the Chukotsk-Anadyr region is faced with difficulties. As this area is very far north, the weather is extremely severe, there are no forests in the greater part, and it is sparsely populated. However, as this area is near Nome where, under the same geological and meteorological conditions, mining technique has been highly developed, placer gold content is high and marine transportation cost is low, the shortcomings may be overcome. With mining open to all enterprises, this may lead to numerous discoveries and an establishment of a new Alaska.

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